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ABSTRACT

Presented is a sequential motor development model for use in the assessment of physically handicapped children by physical educators, and discussed is criterion testing and its role in the identification of motor development. The author points out that professionals are generally relied upon in the areas of auditory and visual evaluations, and discusses the following instruments for use in assessing developmental factors related to the sensory - motor model: Fiorentino's Reflex Test of Central Nervous System Development, the Lincoln - Oseretsky Motor Development Scale, the Purdue Perceptual Motor Survey, the Frostig Test of Visual Perception Development, and the Southern California Battery of Perceptual Motor Tests. Needs in the areas of order and agreement in regard to the sequential nature of motor development, assessment of development, and target behavior expectations for various handicapping conditions are reported. (IM)

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Assessment and Evaluation of the Handicapped Child

by
Jean L. Pyfer

If there is one reality we are facing more than ever before in our professional careers, it is "accountability." Within the next five years every person providing therapeutic and/or rehabilitative services where state or federal funds are involved will be required to demonstrate the effectiveness of his program. Some of you are already familiar with Public Law 94-142. If not, I'm sure you soon will be. In this bill we find both Special Education and physical education mandated for all handicapped individuals within the ages 3-18 (in some cases 0-21) in our country by the year 1982. Built into this Education for all Handicapped Children Act of 1975 are provisions that:

1) each state maintain records of individualized education programs for each handicapped child, and that
2) each state must utilize procedures to assure that testing and evaluation materials are used for the placement of handicapped children.

Some safe guards will be built into the law to monitor our programs to assure that the handicapped population will receive the services prescribed; however, more importantly, if we can believe a representative for the Association of Retarded Citizens who I heard speak Thursday, consumer advocacy groups will strongly encourage parents of handicapped children to become involved with evaluating the delivery services we provide their youngsters. We were told that to insure quality of instruction to the handicapped, parents will be urged to insist that each program for each child include the following components:

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1) identify a sequence of behavior along which their child will be placed,

2) a statement of where along that sequence their child is now performing,

3) a target behavior along that sequence for each child, and

4) a projected date when the child can be expected to demonstrate that target behavior.

What is being proposed has several implications. The first is that we will need to identify sequences of motor development. Though we have progressed considerably in the past few years, I am not sure we are ready to agree on the components of such sequences in all the motor performance areas. Perhaps we could agree on the motor components of an efficient throwing pattern; however, what consensus could we reach if body image were the concept in question? Many of us may insist that an adequate body image is necessary if a child is going to move through space efficiently, but if we cannot define the developmental sequence from which body image emerges, it may not appear as a target behavior for the children in our charge.

Secondly, we will need tools to help us assess where along a motor continuum a child is now performing. This means normative reference testing may have no place in our schema because to state that a child is performing below normal standards on a test does not provide the information we are seeking. The question becomes, "what instrument can I select that will pinpoint a child's level of development upon a hierarchial sequence of motor behaviors?"

Thirdly, we will need the ability to identify target motor behaviors for each handicapped child. Many of us will be limited to expectations of behaviors we learned in "characteristics" courses that too often outlined existing performance levels rather than proposing possible standards of development. By way of example, if I were to ask you to describe the motor behavior of a cerebral palsied child, many of you would resort to descriptive phrases which would depict spastic and athetoid movements. Not many of us would

venture to suggest those involuntary actions might be reduced or inhibited to the point where the child could freely move about. Yet there are some studies available in the literature that demonstrate the plausibility of an expectation of a high level of voluntary control by moderately involved cerebral palsied children.

Lastly, and I think most threatening to me, is the suggestion that I should be able to project a date when an individual child can be expected to demonstrate a stated target behavior. I have spent the last nine years attempting to identify sequences of motor behavior development, assessing where along a hierarchial sequence a child is performing, and identifying target behaviors. And, as difficult as those tasks are, I feel we have some rational basis to carry out those charges. However, when you ask me to estimate at what rate a child will progress, I am without guidelines. Every time a parent poses that question all I can say is that each child progresses at his own rate. I'm afraid we may be many years away from amassing a large enough data base to even begin to make the most primitive estimates as to progression expectations.

I hope you don't interpret these opening remarks as an attempt on my part to encourage you to leave the field of therapeutics. For many years we have fought to be recognized as an important arm in the education of the handicapped child, and I believe we can make a tremendous contribution to the health, welfare and enjoyment of each handicapped child; however, the time is upon us when if we want the opportunity to participate in the growth of these children, we must demonstrate our ability to do so in very concrete terms.

Yesterday I suggested some directions we could take to enable us to progress beyond our traditional backgrounds to some new practices that might benefit the learner. During that talk I introduced a simplistic sequential motor development model and attempted to show which contemporary theorists speak to those sequences and where in the hierarchy they seemed to fit.

Today I will again refer to that model and offer some suggestions about the present day tools available to assess a child's development and the shortcomings of some of those instruments. I will also discuss criterion testing and the role it can play in identifying motor development.

Figure A.

Keep in mind that the model I'm showing you is not intended to represent a fully developed paradigm. Rather it is a basic outline I believe can be expanded to include all areas we deal with (such as physical fitness and sporting skills).

It is intended that the model convey that motor behavior is dependent upon sensory-input, sensory-motor integration and motor output levels of involvement. The developmental flow progresses from the bottom category through to the top category. As physical educators I believe we too often focus our attentions on motor output, and take for granted that sensory input and sensory motor integration has occurred. It has been my experience that such an assumption is not always true in the case of the handicapped child. In the vast majority of cases pre-, or post-natal factors have interferred with the normal progression of development, and as a result, the child we are faced with lacks some ingredients in the sequential hierarchy. Therefore, any model we choose to use to depict developmental sequence must account for output and integration factors, and any technique for assessing performance must also measure these factors

As all of you who work with assessment instruments know, there is no one test available to us today that affords us the luxury of tapping all of these unknowns. I will, however, review some instruments and make suggestions as to what performance they do get at.

First and foremost, some of our instruments do not touch on any of these factors of development. Two such examples are auditory input and visual input. I am aware that the Wepman Test can suggest a problem in the area of auditory input, but that test does not get at precisely where the breakdown is occurring, nor is it satisfactory to use with moderately and severely involved populations. For that information I believe we should rely on the knowledge and abilities of the audiologist.

Figure B

Those professionals in most cases do an acceptable job of pinpointing the dimensions of hearing. In the case of the handicapped child, inability to communicate is sometimes a limiting factor in ability to discriminate hearing ranges; however, as the science of audiology continues to develop even those problems will be overcome.

As regards visual input, there are also some screening tools that can suggest problems. The Snellen charts have been a mainstay for years in determining visual acuity perception, and more recently, stereopsis tests such as the stereo fly provide clues to depth perception problems. But for an indepth analyses of visual input discrimination ability we must look to optomotrists and Opthomoligists.

Figure C

In the case of visual examination of the handicapped, visual inattentiveness and communication problems can be limiting factors, but internal examination of the eye has been objectified to the point where very accurate assessment, regardless of a child's ability to cooperate, is possible.

Sensory - Motor Overlay

The following instruments I will review purport to assess some aspects of developmental factors included on this sensory motor model. I say "purport" because those of you who have studied those instruments are well aware of the problems inherent in each instrument. I will address those

shortcomings after introducing the tests.

Figure D

One instrument I believe has great possibiliites in our field is Fiorentino's Reflex Test of Central Nervous System Development. This is the test that evolved from the Bobaths' classic work with the cerebral palsied; however, my experience has been that reflex problems are in no way limited to cerebral palsied individuals. Many of the classical movements we have come to identify with profound and severely retarded are a direct result of low level reflexes that have not been inhibited within normal developmental timelines. Recently while visiting a very progressive school for the retarded in our state, I asked how many of the clients had cerebral palsy involvement. Without hesitation I was told that none did. Yet during lunch as I observed the clients move around the cafeteria, I saw several flexor withdrawal and extensor thrust reflexes in action. And when school officials asked me to look at their only three clients who were not mobile, I saw severe involvement of spinal and brain stem level reflexes. Reflex problems also create much of the clumsiness attributed to some learning disability children. As subjective as the Fiorentino test is, in the hands of a competent administrator it is a valuable tool in pinpointing motor development problems.

Figure E

A test many of you who work with the retarded are familiar with is the Lincoln-Oseretsky Motor Development Scale. This test is one of several revisions of the Oseretsky Tests developed in the 1920's by a Russian. As with the next three tests I will review there are some problems with this Scale, but it does serve to give us some feedback in the areas indicated on this overlay.

Figure F

Another instrument, the Purdue Perceptual Motor Survey, is widely used throughout our schools. When used as a survey instrument some information about integration and motor output performance can be acquired.

Figure G

I have included the Frostig Test of Visual Perception Development because of its popularity with classroom teachers. Most of the data we have analyzed from this test suggest that the subtests may not tap individual visual integration abilities, but it does seem to get at some visual component in the developmental hierarchy.

Figure H

The Southern California Battery of Perceptual Motor Tests has probably been exposed to more rigorous standardization procedures than any of the tests mentioned previously. At least the statistical analyses of the data appear in greater detail in the manuals than is the case with the other examples. The developer, Dr. Jean Ayres, is also more sensitive to who uses the instruments than are the developers of the other three instruments. Within the last month she has strongly urged that anyone who has not been certified by her instructors not to use the tests nor to make interpretations about the test results. I believe the battery shows great promise in getting at some problems handicapped children demonstrate.

The limitations of the Lincoln, Purdue, Frostig and Southern California Battery are many. First of all the validity and reliability are in serious question. We do not know if the instruments measure what they purport to get at, nor if they can be dependably used with children who demonstrate a wide variety of developmental problems.

Many of them are contaminated both by age and cognition abilities. That is, the younger the child, the poorer the performance that can be expected, and the lower the cognitive development, the more difficult it is for the child to comprehend what it is you are asking him to do.

Another problem that results from use of these instruments is the literal interpretation on the part of the examiner. I have seen each of these instruments used in isolation and outlandish statements made about a child's abilities or inabilities. We must recognize that each may tap very isolated or very global behaviors that may in effect result from some underlying deficit. The best example I can give of this is that we have data that indicate children who have reflex problems do poorly on the Posture and Balance portion of the Purdue Survey. If an individual who has found problems on the Purdue attempts to remediate posture and balance without first assertaining the absence of reflex difficulty, he is assured of a long, hard, maybe impossible task. We also know that children who have depth perception problems because their eyes do not team have extreme difficulty with balance tasks and many output motor behaviors. Visual tracking activities demanded by many programs can magnify the visual input problem and in some cases create irreversible visual problems.

As you have seen, none of the instruments reviewed is truly comprehensive. There is no one instrument on the market that I know of that adequately assesses all levels of sequential development. Even if each was valid, reliable, free from age and cognition contamination and was not subject to the administrator's limitations, each would have to be used in conjuction with other information. Therein lies the difference between assessment and evaluation.

It is one thing to administer one or a group of instruments - that is to assess performance abilities. It is quite another thing to interpret the results in light of the limitations of the test, the ability of the child to understand what is being asked of him, the limitationsof the test administrator and, an area I haven't even touched on, the testing conditions. All of these factors must be taken into consideration when evaluating a child. In addition, information about the developmental history of the

child, his medical status, and educational report and results of a visual and auditory exams are extremely helpful in determining where and how a child is functioning. To truly evaluate a child, a many faceted picture must be constructed to aid us in interpreting how to plan a program that will benefit the child's development.

Once a program is designed and implemented we have found it very helpful to criterion test periodically to determine how the child is progressing. A criterion test, as many of you know, is a pre-determined standard of performance you will accept as evidence a child has progressed along a developmental sequence. An example is, at the sensory input level we will accept absence of demonstrated abnormal reflexes as adequate criteria of progress. That is when a child no longer demonstrates the abnormal reflexes we have been working to inhibit, we are willing to attest to his progress in that area of development only. We would then progress to working on abilities or skills that depend upon absence of those reflexes for mastery. Another example might be that when a child can demonstrate an ability to perform across his midline without interruption of movement on ten different specific tasks, we would adjudge that bilateral integration has occurred and proceed to output behaviors that require such integration for their mastery.

Designing criterion tests requires a thorough knowledge of motor development, an expertise in isolating separate parts of movement patterns and an ability to spell out conditions necessary for accepting a movement pattern as successful. A good criterion test can be administered by a variety of professionals who have a knowledge of children and a sharp eye for detail.

Another instrument we have need of is a screening test that would help us separate severe problems from moderately and mildly involved motor difficulties. We have been studying a screening inventory that was developed by two adapted physical educators in Lawrence, Kansas. The instrument screens reflex development, tactile localization, ocular control, static and dynamic balance

hand eye coordination, foot eye coordination, body image and form perception. We have found that when we statistically compare the profile's results with knowledgeable adapted physical educators' opinions, the profile reliably separates mild, moderate and severe motor dysfunction. Using discriminate analysis 19 of the 38 variables were identified as being able to significantly discriminate the three types of screening referral groups. The instrument must be widely field tested before I get too excited about its possibilities; however, it is a step in the right direction.

In summary, we are at the point in time when professionals in all areas of rehabilitation are being required to demonstrate the viability of their therapeutic programs. For the first time in history we have a public law that includes physical education (by name) in conjunction with educational needs of the handicapped. To enjoy participation in programs that may be funded under that law we will be required to identify sequences of motor behavior, to measure where along that sequence a child is performing, to identify where along that sequence a child should be able to perform and when it would be reasonable to expect the child to demonstrate that ability.

We have partially identified sequences of motor behavior, we have some test instruments that purport to measure some aspects of motor development, we have varying degrees of ability to interpret those tests, we realize we need a variety of additional information and expertise to apply that information, and we can use criterion tests to assess the progress of a child toward attaining target behaviors.

We have fought hard for a visable role in helping the handicapped child. Before we can fully realize that opportunity, a national effort must be made to bring some order and agreement to the sequential nature of motor development, how that development can be adequately assessed, and what target behaviors can be realistically expected for various handicapping conditions.

We can and must demonstrate our professional ability to deliver the benefits we have promised.

SENSORY MOTOR DEVELOPMENT MODEL

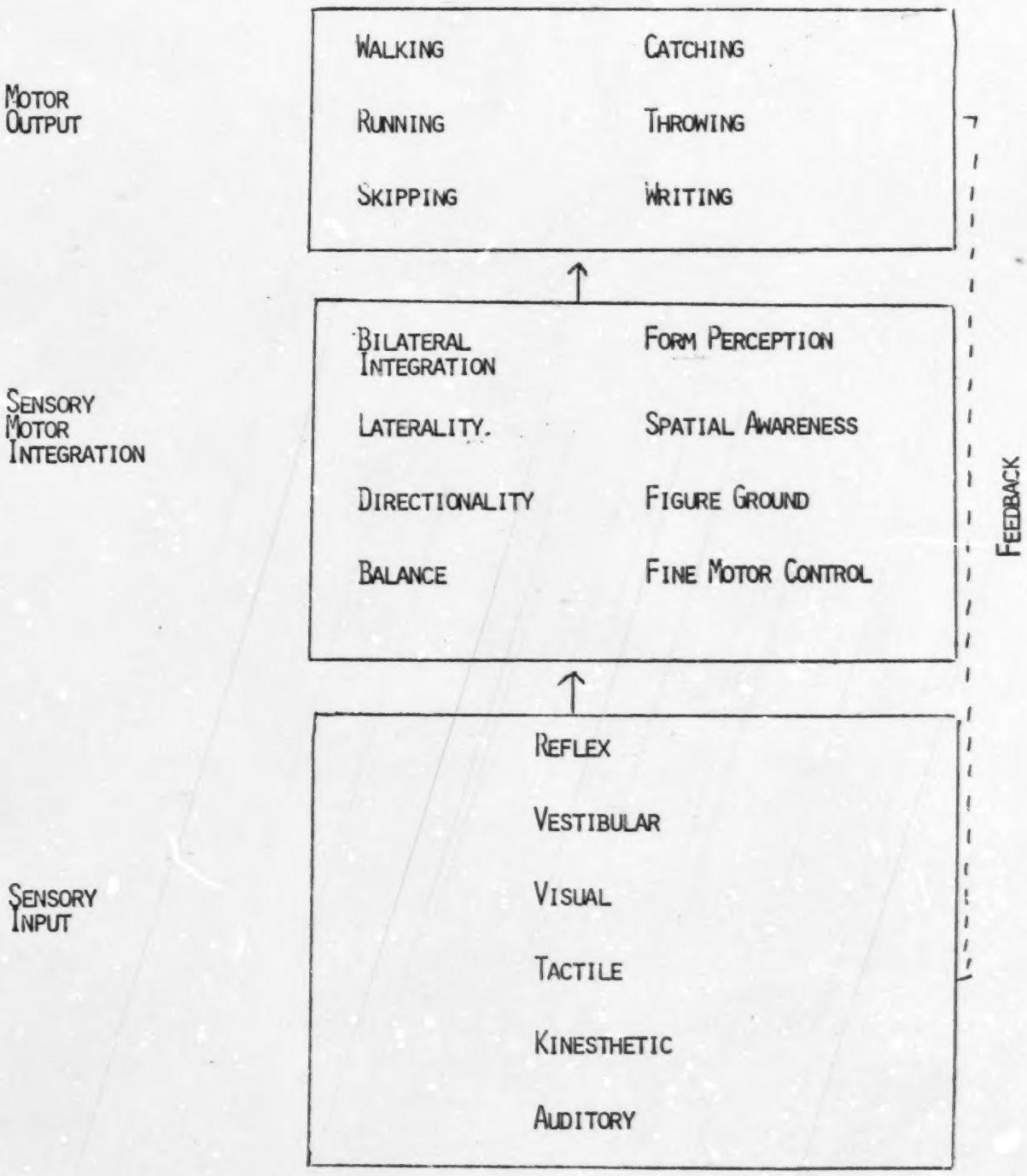

FIGURE B

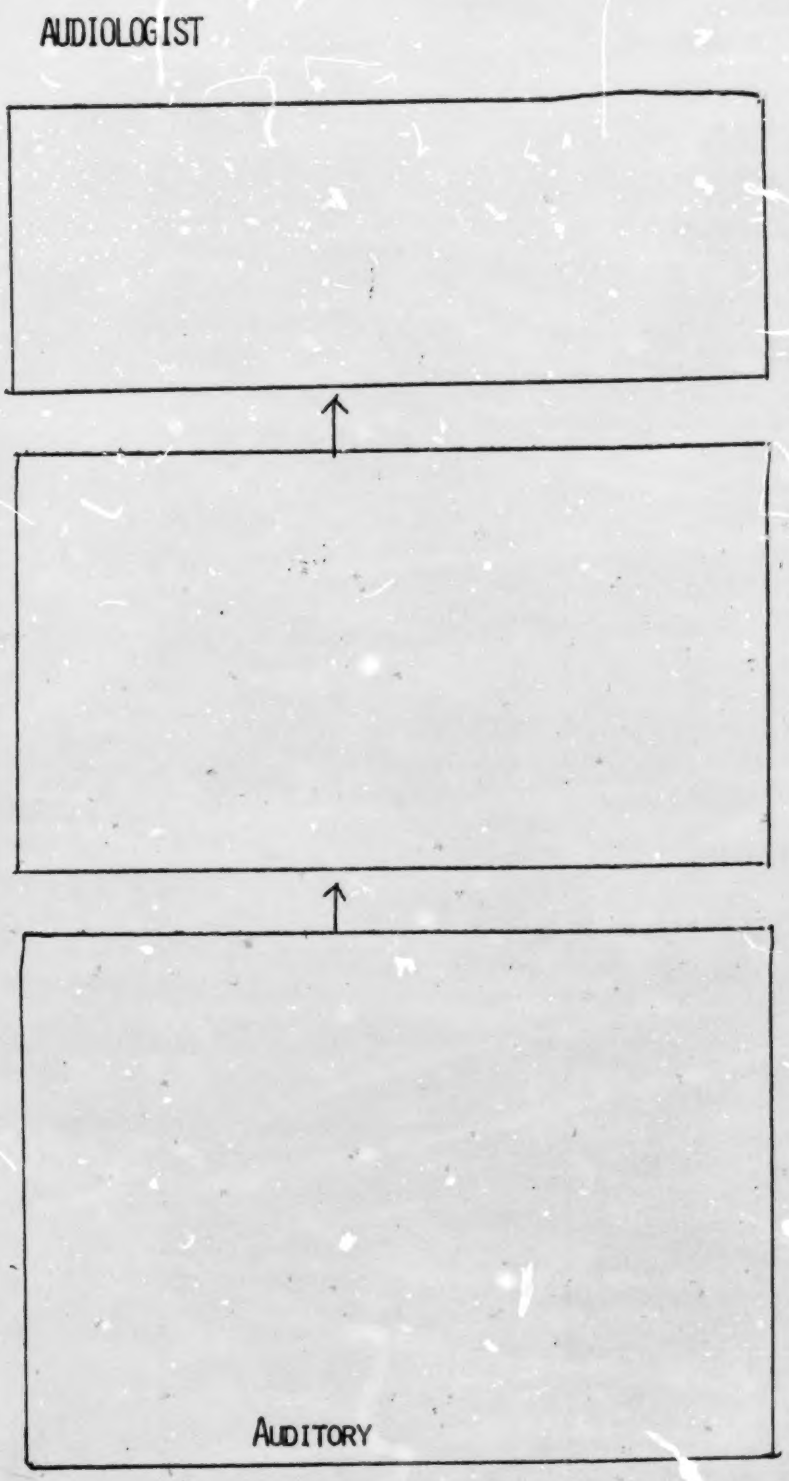

FIGURE C

OPTOMETRIST OR OPTHALMOLOGIST

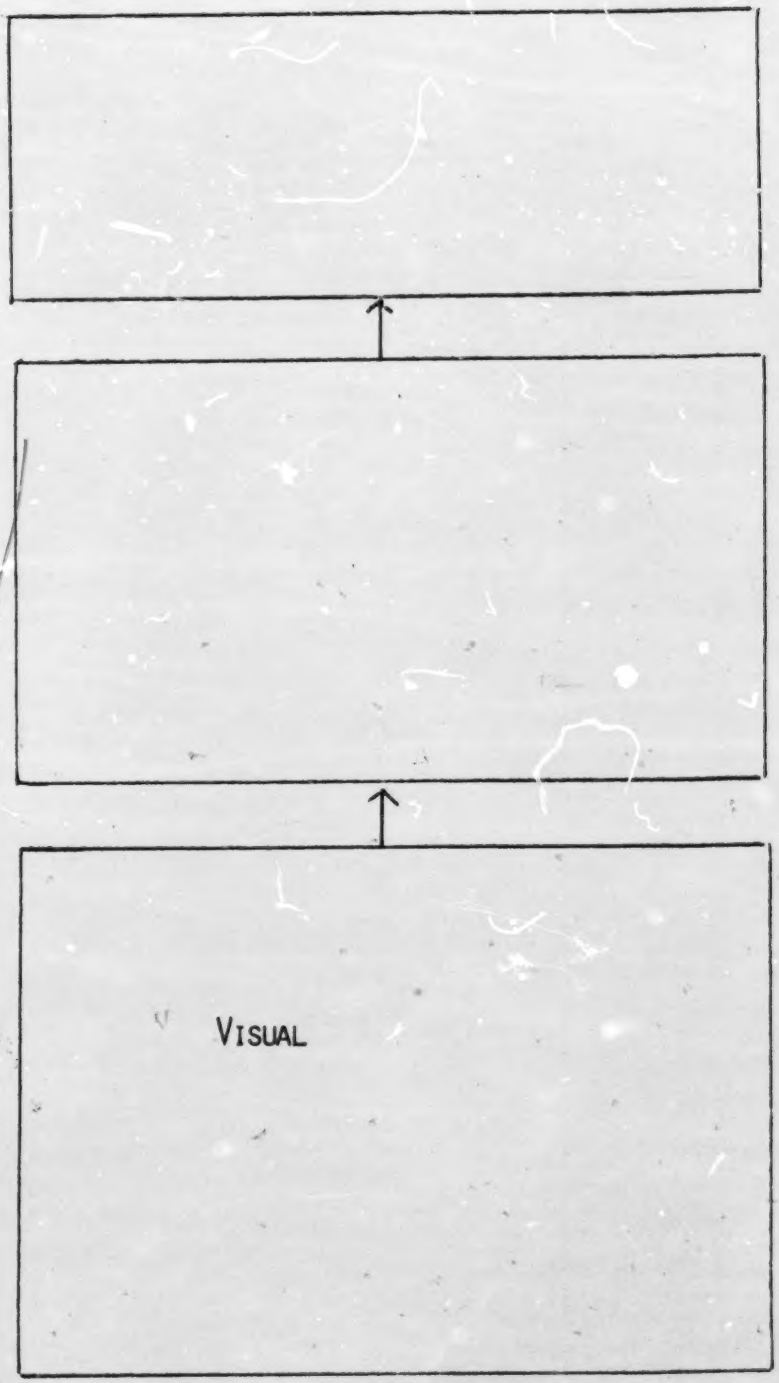

FIGURE D

FIORENTINO REFLEX EVALUATION

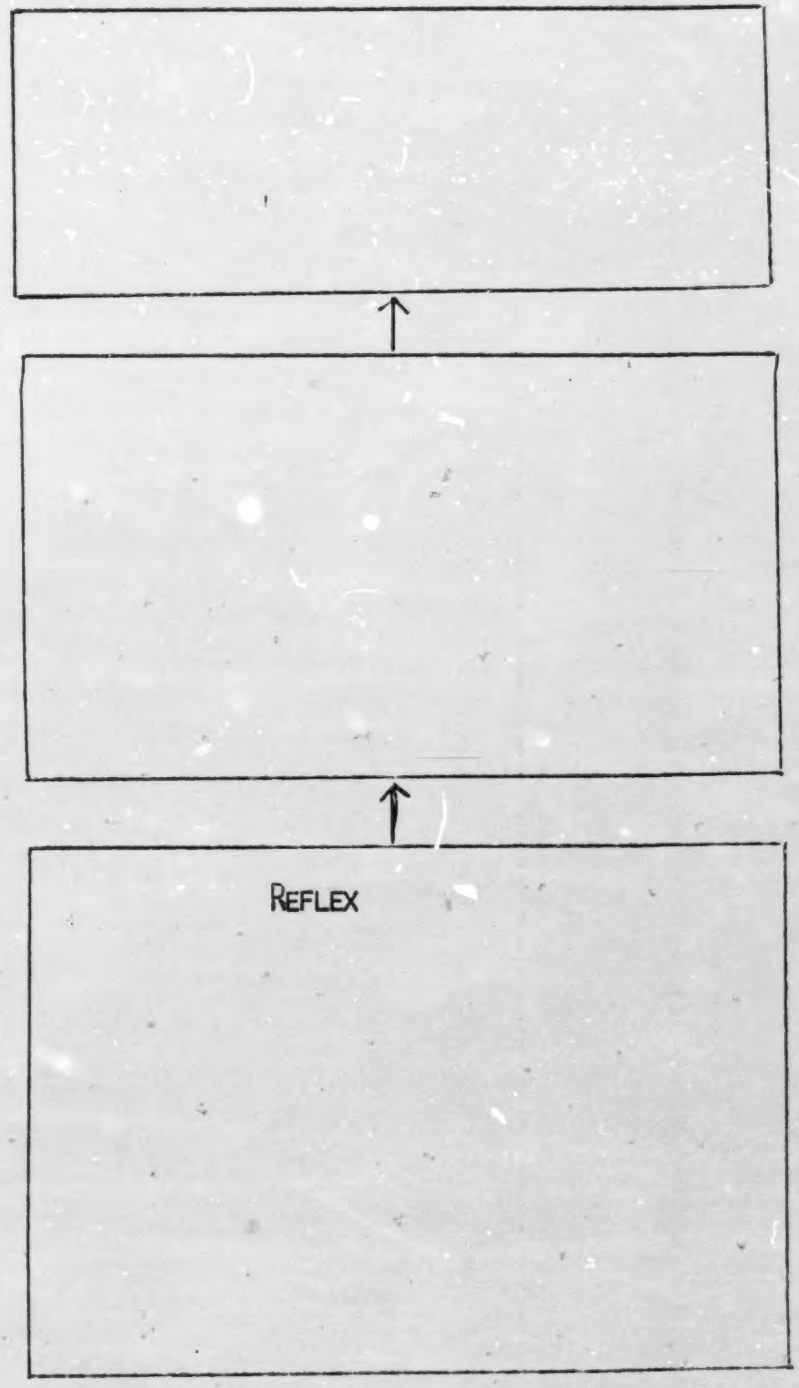

FIGURE E

LINCOLN OSERETSKY MOTOR DEVELOPMENT SCALE

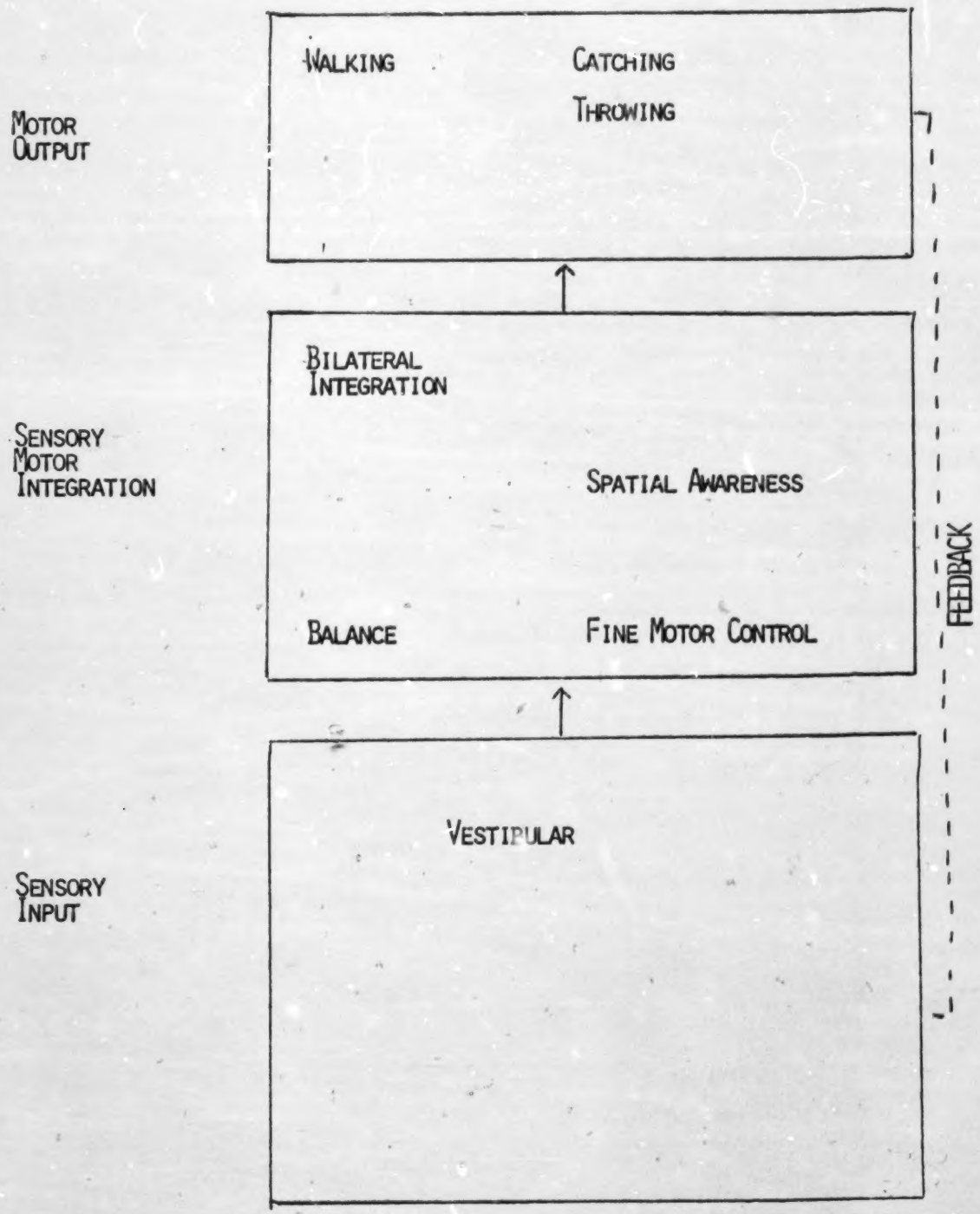

FIGURE F

PURDUE PERCEPTUAL MOTOR SURVEY

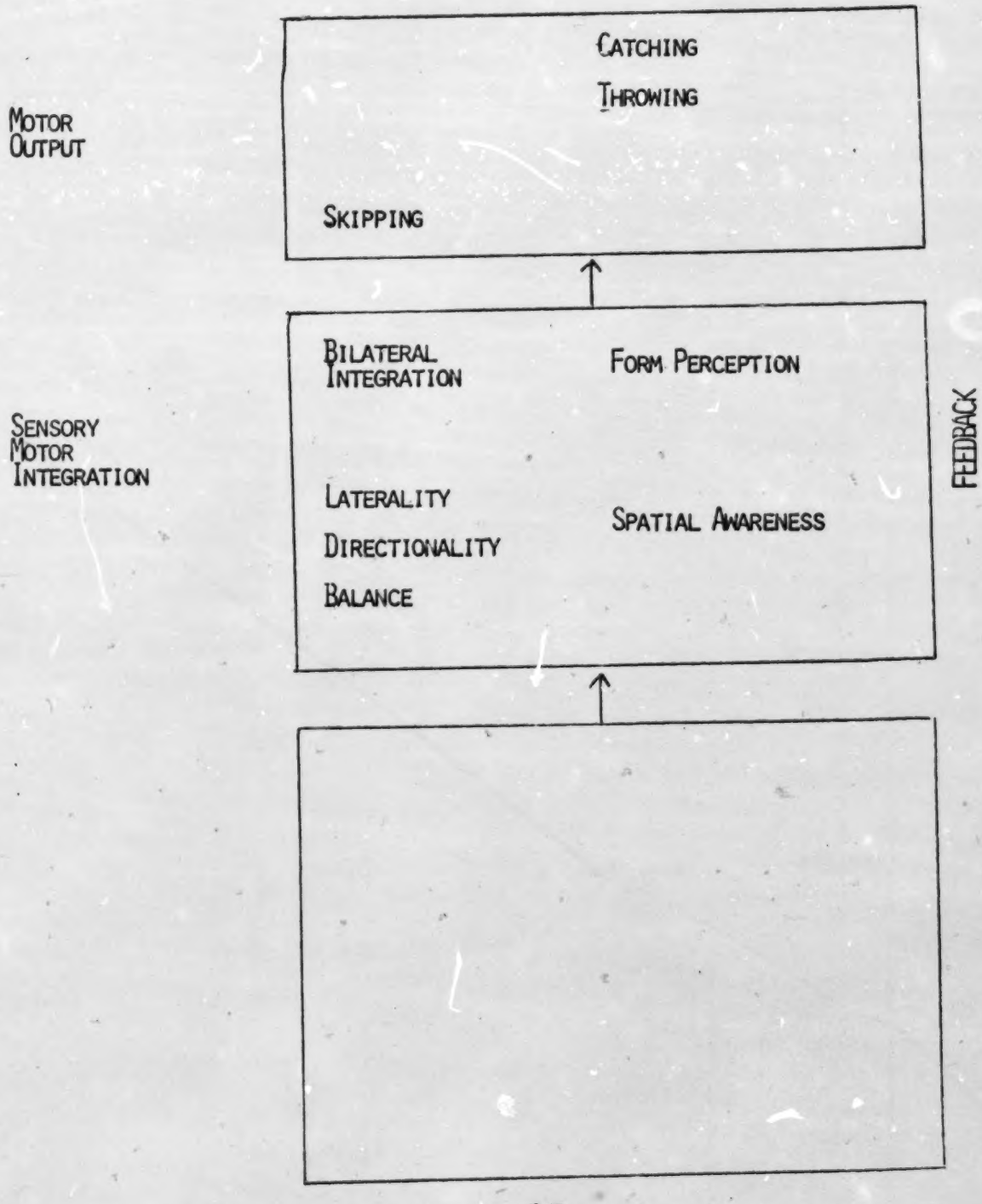

FIGURE G

FROSTIG TEST OF VISUAL PERCEPTION DEVELOPMENT

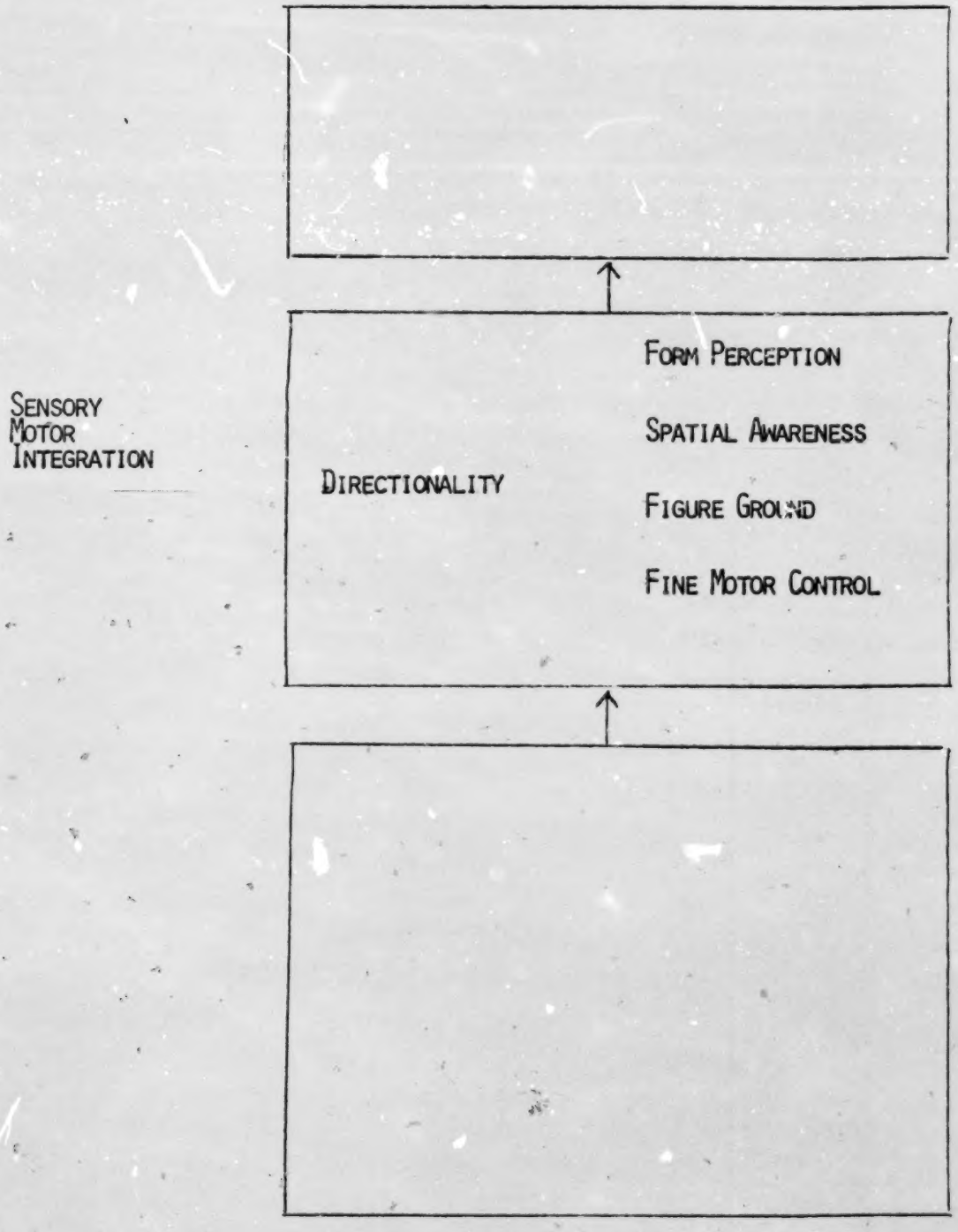

FIGURE H

So. CALIFORNIA BATTERY OF PERCEPTUAL MOTOR TESTS